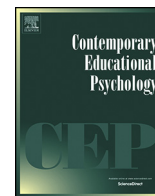




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## Achievement emotions in higher education: A diary study exploring emotions across an assessment event

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## ABSTRACT

An increasing number of emotions have been found to affect the way students learn and their academic achievement. However, little is known about how dynamic these achievement emotions (AEs) are, the extent to which they vary with the assessment process, and how they relate to prior academic ability and student achievement outcomes. Our intensive longitudinal diary study with tertiary students ( $N = 166$ ) examined their AEs across a three week assessment period (study, test and feedback week). Overall, the results indicated that emotions during the study and test week were unrelated to both GPA and test score, but the starting level of emotions during the feedback week were related to GPA and test score. The changeability of emotions were not related to either GPA or test score. Overall, AEs seem to have a meaningful relationship to achievement only once results are known. These findings expand our knowledge about the relationship between AEs, prior academic ability and achievement and how emotions change across an assessment event.

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### 1. Introduction

Achievement emotions (AEs) are “emotions that are directly linked to achievement activities or achievement outcomes” (Pekrun, Goetz, Frenzel, Barchfeld, & Perry, 2011, p. 37). Achievement activities include tests, assignments, and performances whether in exam conditions or as take-home tasks. Achievement outcomes include scores, grades, grade point averages, and the like. These achievement activities and outcomes evoke within students a variety of AEs. For example, enjoyment, hope, pride, anxiety, boredom and shame (Pekrun et al., 2011) are some of the emotions identified in western educational environments related to academic achievement. In oriental contexts (Buchtel, 2009; Kitayama, Mesquita, & Karasawa, 2006), additional emotions, especially those having to do with relationships and social obligations (e.g., respect, calmness,

indebtedness, and friendliness), have been identified as important emotions.

This paper contributes to our understanding of AEs by examining the dynamic nature of AEs through an assessment process (i.e., studying for, taking, and receiving scores on a high-stakes mid-term test) and by linking the changing nature of emotions to prior academic performance and test achievement. The paper also explores models that attempt to integrate emotions from western and oriental approaches by seeking commonalities among the emotions. It uses a relatively novel diary study method to intensively investigate repeated self-report of emotions within an assessment context. This paper could assist in improving AE theories, as well as developing insights as to how greater self-regulation of emotions may relate to students' achievement.

#### 1.1. Theoretical background: structure of AEs

Research into AEs has been dominated by Pekrun's Control-Value Theory (CVT; Pekrun, 2006) which combines principles from a number of different theories including attributional theories of achievement emotion, expectancy value approaches to emotions, theories of perceived control, and models on the effects of emotions on learning and performance (see Pekrun et al., 2011 for a review). The CVT model and related empirical studies propose that AEs have three dimensions: *valence* (positive/pleasant vs. negative/unpleasant); *activation* (activating vs. deactivating); and *object focus* (activity vs. outcome).

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### 1.1.1. Valence

In the CVT model positive AEs include emotions such as joy, hope, pride, gratitude, contentment, relaxation, and relief; whereas, negative AEs include emotions such as anger, frustration, anxiety, shame, anger, boredom, sadness, disappointment, and hopelessness (see Pekrun, Frenzel, Goetz, & Perry, 2007 for a review). The same positive–negative polarity of valence has been identified in research on emotions in Japan (Kitayama et al., 2006) and China (Buchtel, 2009). To date the majority of research on emotion has tended to focus mostly on negative emotions (e.g., anxiety, fear, boredom, and shame), despite qualitative studies among school and university students in different academic settings (e.g., in class, studying, during tests) in which students not only reported many emotions but they described positive and negative emotions with similar frequency (Pekrun, Goetz, Titz, & Perry, 2002).

### 1.1.2. Effect

The effect of AEs can be considered to either contribute to greater learning effort (i.e., activating or engaging), or be neutral towards learning, or maladaptive towards learning (i.e., deactivating or disengaging). This learning effect interacts with valence so that emotions might be positive and deactivating or negative and engaging. In general, positive emotions tend to be activating except for those which seem to be associated with a sense of accomplishment that removes the need to exert further effort to learn (e.g., relaxation, contentment, and relief). In contrast, negative emotions are almost equally split between those which activate efforts to improve (e.g., anger, frustration, anxiety, and shame) and those which are associated with decreased effort (e.g., boredom, sadness, disappointment, and hopelessness) (Pekrun et al., 2007). However, the effect of emotion on student achievement can also vary depending on the individual's cognitive resources and motivational approach. For example, a recent study that compared a group of secondary school students found that trait anxiety was negatively associated with cognitive test performance among students with lower working memory capacity; whereas, it had the opposite effect for higher working memory capacity students (Owens, Stevenson, Hadwin, & Norgate, 2014).

It is also worth noting that not all research studies agree on the effect of various AEs. For example, while there is agreement that shame is a negative, activating emotion, anger is seen by Pekrun et al. (2011) as negative activating, while Buchtel (2009) and Kitayama et al. (2006) consider it to be a negative deactivating emotion. Likewise, pride is seen as a positive activating emotion by Pekrun et al. (2011), while for the other two researchers it is a deactivating positive emotion. While these discrepancies are relatively minor, it does suggest an overall lack of agreement as to the effect of AEs.

### 1.1.3. Object focus

Understandably, AEs seem to be context specific within the achievement environment. AEs exist in relation to a learning activity (e.g., studying for a test) and to an outcome (e.g., getting an A or F grade on an assignment). A further context effect on AEs is whether the outcome is prospective (i.e., in anticipation of the result) or retrospective (i.e., in reaction to the actual results). Hence, by looking at the AEs in relation to both learning activities and learning outcomes, it is possible to capture the variation in AEs leading up to an assessment event (when learning and studying for and anticipating an outcome), but also during an actual assessment event (e.g., during a test), and in relation to the learning outcome (both in anticipation of the result and in appraisal of the result once it is known).

Thus, the range of AEs possibly depends on the interaction among the outcome, time-frame, the valence of the emotion, and its effect. For example, a student who reports enjoying a particular science

lesson as a consequence of having had a vivacious teacher could be described as experiencing a positive, retrospective, activating, learning or activity related emotion. In contrast, a student experiencing hopelessness about an upcoming test could be described as experiencing a negative, prospective deactivating, outcome (i.e., test) related emotion.

## 1.2. Stability of AEs

AEs change across the assessment process; different intensities and types of AEs occur prior to an assessment while students are studying for a specific type of evaluation, during the execution of that evaluation, and after the evaluation is completed (Pekrun et al., 2004). Goetz, Preckel, Pekrun, and Hall (2007) found that cognitive ability was related to the emotions felt before, during, and after a test with high ability students reporting more enjoyment while doing a test than low ability students, and low ability students reporting significantly more anxiety during the test and more anger across the entire testing process. Furthermore, in a cross-sectional study of tertiary students Pekrun et al. (2004) found that students recalled anxiety most *before* a high-stakes exam, hope and relief *during* the taking of the exam, and relief *after* the exam. In general, positive AEs increased over the three process points, while the frequency of negative AEs 'anxiety' and 'hopelessness' decreased over the same time. More specifically, three negative AEs (i.e., anger, shame and sadness) increased *during*, but decreased *after* the exam, whereas, 'disappointed' increased *during* and stayed the same *after* the exam. However, a significant disadvantage of the Pekrun et al. (2004) study was that it used retrospective recall after the examination which is likely to be less sensitive to subtle changes in emotion experienced during the actual event itself.

This last point identifies a considerable weakness in AE research. Most data collection has happened at a single time-point, despite achievement evaluation clearly having three significant time-points (i.e., prior, during, and post). In most AE studies, the AEs have been measured at only one time-point in relation to the assessment event, although different time-points have been used. For example, Pekrun, Elliot, and Maier (2009) measured the students' AEs a day prior to a specific exam; whereas, AEs measured by Daniels and colleagues (2008, 2009) were general course-related AEs collected in the middle of the semester (approximately 4–5 months after the beginning of the semester).

More recently, a longitudinal study of secondary students' AEs while studying mathematics collected data at three time points over three consecutive school terms (Ahmed, van der Werf, Kuyper, & Minnaert, 2013). The students' negative activating emotion anxiety remained more or less constant, while the negative deactivating emotion boredom increased over the three time points. In contrast, the positive AEs (enjoyment and pride) decreased over the three time points. Across the three school terms, students achieved more if their (a) average enjoyment was higher, (b) average pride, anxiety, and boredom were lower, (c) enjoyment and pride changed more, and/or (d) anxiety and boredom changed less. Nonetheless, a weakness of this study is that it used a general course grade measure of achievement rather than performance on a specific test or assignment. In addition, students' AEs were measured three times each separated by a school term. This means that the study has less to tell us about the subtle variations in student emotions over a specific assessment event and how those emotions and their changes might relate to learning achievement.

## 1.3. Learning and achievement and AEs

The CVT proposes that AEs are associated with different academic outcomes because of their effect on study processes and behaviours. Students' AEs directly, indirectly, and reciprocally

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